Space Weather Forecast

Issued on Thursday, 05 October 2023 at 13:20 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class flares throughout. Slight chance of an isolated Minor Storm interval on Day 2 (06 Oct).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity is Low, with minor Common-class flares in the last 24 hours. Nine sunspot regions feature on the visible disc. The largest region is positioned north centre disc, however it still has a fairly straightforward magnetic structure. Another region just to the north of the largest region has minor growth in the trailing spot. Another relatively large region in the southwest has not changed much. The other regions appear mostly small and simple at the present time. No new Earth-directed Coronal Mass Ejections (CMEs) have been observed in the last 24 hours.

Solar Wind / Geomagnetic Activity: Solar winds have been at slightly elevated levels with a general upward trend noted, probably due to connection to a minor high speed stream (HSS) and have now risen to around 440 km/s. The interplanetary magnetic field was weak to moderate, with the north-south component varying weakly and mostly southward directed. Geomagnetic activity was Quiet to Active with an unexpected minor storm interval recorded between 05/0300UTC to 05/0600UTC, and perhaps related to the incoming HSS.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels, with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low solar activity is expected, with a chance of isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: A solar eruption observed on 02 October appears to have given a faint, rather slow Earth-directed CME. Confidence is low in both the likelihood of this feature reaching Earth, and in the timing of any arrival. This feature could affect Earth either late on Day 1 (05 Oct) or more likely in the first half of Day 2 (06 Oct). No other CMEs feature in the forecast. No significant coronal hole fast winds are forecast. Geomagnetic activity is expected to be Quiet to Unsettled. This may become Active should the aforementioned CME arrive, with a slight chance of a Minor Geomagnetic Storm interval.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is most likely to remain at background levels, with a very low risk of enhancements from the current sunspots on the disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	15	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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